



March 6, 2014

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S. W.
Washington, D. C. 20554

Re: Expression of Interest – Rural Broadband Experiment
WC Docket # 10-90

Dear Ms. Dortch,

Capshaw Enterprises, LLC dba Crossroads Wi-Fi of Middleton, TN (Crossroads) is submitting this Expression of Interest (EOI) to the Federal Communications Commission for its Rural Broadband Experiment (RBE) funding program under WC Docket No.10-90.

Entity Description

Crossroads is private fixed wireless operator whose principal area of operation is in Hardeman County, TN. Beginning its operations in 2011, Crossroads currently provides Internet connectivity to approximately 300 customers in its service area, delivering bandwidth speeds ranging from 1Mbps x 256 kbps to 2 Mbps x 1 Mbps. Crossroads intends to apply for program funding to significantly enhance its broadband speed offerings above the RBE program minimum thresholds and expand its service footprint to reach all un-served and underserved locations within Hardeman County. Crossroads plans to affiliate with an Eligible Telecommunications Carrier (ETC) partner certified in the State of Tennessee to provide commercial and residential voice services. Additionally, Crossroads is currently in discussions with C-Spire Fiber, Comcast Cable, and the Time Warner Cable operator in Bolivar, TN about additional Internet backhaul capacity to support this proposed expansion project.

Proposed Service Area

Crossroads' present customer base is located primarily in the southern portion of Hardeman County and Crossroads plans to expand its network infrastructure footprint and bandwidth capability to ensure that all locations eligible for RBE funding within the Hardeman County census tracts 47069950100, 47069950200, 47069950300, 47069950400, 47069950500, and 47069950600 receive robust bandwidth above the program's minimum levels. Exhibit 1 to this EOI contains a census tract reference map of Hardeman County that shows the location of each of the proposed census tracts to be served with upgraded and expanded service. To provide perspective of the area that Crossroads proposes to serve, Exhibit 2 to this EOI contains an updated map by Connected Tennessee showing the areas served by providers advertising Internet speed availability of 3 Mbps download and 768 kbps upload. It should be

noted that the proposed Crossroads network will also provide unfunded overlap of some of the areas currently advertised as served on the Connected Tennessee map.

Anchor Institutions To Be Served

Crossroads provides free and deeply-discounted service to anchor institutions within its existing service territory. Crossroads would continue this practice within the proposed expansion areas and also to those anchor institutions located in the served areas (those with greater than 3 Mbps availability) that can be reached by Crossroads' network overlap. The chart below lists Hardeman County anchor institutions with their location in served or un-served areas and comments regarding Crossroads plans to be the primary or alternative broadband service provider.

Hardeman County Anchor Institutions		
Name of Anchor Institution/Location	Served/Unserved	Comments
Hardeman County Library – Bolivar, TN	Served	Will offer b/w as alternative or supplemental provider
Middleton Library	Served	Will offer b/w as alternative or supplemental provider
Grand Junction Library	Served	Will offer b/w as alternative or supplemental provider
Whiteville Library	Served	Will offer b/w as alternative or supplemental provider
Bolivar General Hospital	Served	Will offer b/w as alternative or supplemental provider
Hardeman County Health Department	Served	Will offer b/w as alternative or supplemental provider
Bolivar Central High School	Served	Will provide access to fiber backbone, if available, or wireless
Bolivar Middle School	Served	Will provide access to fiber backbone, if available, or wireless
Bolivar Elementary School	Served	Will provide access to fiber backbone, if available, or wireless
Middleton High School	Served	Will provide access to fiber backbone, if available, or wireless
Middleton Middle School	Served	Will provide access to fiber backbone, if available, or wireless
Middleton Elementary School	Served	Will provide access to fiber backbone, if available, or wireless
Whiteville Elementary School	Served	Will provide access to fiber backbone, if available, or wireless
Toone Elementary School	Un-Served	Will provide access to fiber backbone, if available
Hornsby Elementary School	Served	Will provide access to fiber backbone, if available, or wireless
Grand Junction Elementary School	Served	Will provide access to fiber backbone, if available, or wireless
County Home School Population	Un-served	To be served via fixed wireless
University of Memphis – Bolivar Campus	Served	Will offer b/w as alternative or supplemental provider
Tennessee Technical College - Whiteville	Served	Will offer b/w as alternative or supplemental provider
Hardeman County Airport	Un-Served	Will provide access to fiber backbone, if available
Hardeman County Industrial Park	Un-Served	Will provide access to fiber backbone, if available
Madison Haywood Development Center	Served	Will offer b/w as alternative or supplemental provider
Bolivar Police Department	Served	Will offer b/w as alternative or supplemental provider
Middleton Police Department	Served	Will offer b/w as alternative or supplemental provider
Whiteville Police Department	Served	Will offer b/w as alternative or supplemental provider
Grand Junction Police Department	Served	Will offer b/w as alternative or supplemental provider
Hardeman County Sheriff Department	Partially Served	Will serve locations in county w/out service via wireless
Bolivar Fire Department	Served	Will offer b/w as alternative or supplemental provider
Whiteville Fire Department	Served	Will offer b/w as alternative or supplemental provider
Toone Fire Department	Un-Served	To be served via fixed wireless
Silerton Volunteer Fire Department	Un-Served	To be served via fixed wireless
Hornsby Fire Department	Served	To be served via fixed wireless
Middleton Fire Department	Served	Will offer b/w as alternative or supplemental provider
Saulsbury Fire Department	Un-Served	To be served via fixed wireless
Hickory Valley Fire Department	Un-Served	To be served via fixed wireless
Grand Valley Lakes Fire Department	Un-Served	To be served via fixed wireless
Hardeman County Courthouse	Served	Will offer b/w as alternative or supplemental provider
Bolivar City Hall	Served	Will offer b/w as alternative or supplemental provider
Whiteville City Hall	Served	Will offer b/w as alternative or supplemental provider
Toone City Hall	Un-Served	To be served via fixed wireless

Hornsby Town Hall	Served	Will offer b/w as alternative or supplemental provider
Saulsby Town Hall	Served	Will offer b/w as alternative or supplemental provider
Grand Junction City Hall	Served	Will offer b/w as alternative or supplemental provider
Hickory Valley Town Hall	Un-Served	To be served via fixed wireless
Hardeman County Chamber of Commerce	Served	To be served via fixed wireless
Chickasaw State Park	Un-Served	To be served via fixed wireless

Broadband Technology Plan

Crossroads' existing fixed wireless network consists of a variety of radio frequency equipment that is used on the network access points located on dedicated towers, water towers, and other available structures to reach its existing customers. From its single point of network backhaul access at Crossroads' Network Operations Center (NOC) in Middleton, TN in southern Hardeman County, Crossroads radio transmitters hop the signal to a cascade of access points over distances of several miles throughout the county, resulting in bandwidth degradation at the more distant locations. The topological characteristics of Hardeman County feature hilly terrain and heavily-forested areas with deciduous and evergreen (pine) foliage. Lines-of-sight between radio towers and customer locations are limited and the proposed network will require several additional tower locations to ensure customer access to the network radios. The challenge to providing robust bandwidth connectivity to all county areas lies in the limited number of access points, the nature of the terrain, and the distance of some of the remote access points from the NOC's point of origin.

The broadband technology plan for Crossroads' proposed project will be an upgrade and expansion of its fixed wireless network with a fiber optic component. The project plan will involve the establishment of two new secondary NOC centers, with discrete network backhaul providers, in Whiteville, TN and in Bolivar, TN, both in addition to the original NOC in Middleton. The new Whiteville NOC will serve the northern portion of Hardeman County; the new Bolivar NOC will serve the central county area; and the original Middleton NOC will continue to serve the southern county area. From each of the NOC locations, a fiber optic backbone will be built to deliver very high bandwidth capacity to strategically-located primary radio transmitters within the NOC's service territory. From the primary radio transmitters, licensed wireless links will disperse high bandwidth levels to several secondary wireless access points that deliver desired bandwidth to connected customer locations. Additionally, fiber will be built to interconnect all of the NOCs for bandwidth redundancy and fail-over capability. The fiber backbone to the primary radio locations and NOC interconnections will be designed with high strand-count cables (96-count and 144-count) and routed near key anchor institutions, potential commercial users, and high-density residential locations for FTTH considerations, as they develop. To overcome the line-of-sight issues present with the county's topology, new licensed towers of sufficient height (typically 300') will be constructed at appropriate locations. Exhibit 3 of this EOI illustrates how the proposed expanded network would provide coverage across Hardeman County.

In addition to its use of traditional fixed wireless technology, Crossroads is interested in the deployment of TV white-space technology for its service delivery. Crossroads will continue to monitor the improvement of TV white-space and the FCC's role in licensing and developing this

technology. Further, Crossroads hopes to implement a FTTX strategy with its planned fiber assets as a future phase of this project.

Project Scalability

Crossroads anticipates that its proposed project plan would be implemented in a single phase. However, based upon funding availability, the project could be scaled in two or more phases, for the deployment of the two new NOCs and their associated service areas. As mentioned above, Crossroads would design its fiber backbone to accommodate a FTTX deployment in the future.

Project Timing

Assuming that the project could be completed as a single phase as described above, Crossroads anticipates that the project would take two years to complete, beginning in early 2015.

Year 1 –

- Design of the fiber backbone, beginning with the Middleton NOC service area, and continuing with the Whiteville NOC and Bolivar NOC areas.
- Design of the new tower locations and application for licensing of wireless links.
- Utility make-ready activity for pole attachments.
- Material/equipment ordering from design bill of materials (Middleton area).
- Construction of fiber backbone and new towers in Middleton NOC area. (estimated 60% of total fiber and tower sites)
- Activation and marketing of completed Middleton area.
- Material/equipment ordering from design bill of materials (Whiteville and Bolivar NOC areas)

Year 2 –

- Utility make-ready activity for pole attachments.
- Construction of fiber backbone and new towers in Whiteville and Bolivar NOC areas. (estimated remaining 60% of project construction activity)
- Activation and marketing of completed Whiteville and Bolivar areas.

Planned Service Offerings

For this new project, Crossroads proposes this new Internet pricing plan for existing and new customers in upgraded and expanded network areas:

Crossroads Wireless Service (Residential or Commercial)

1 Mbps x 256 kbps	-	\$39.95
3 Mbps x 1 Mbps	-	\$59.95
5 Mbps x 2 Mbps	-	\$79.95
10 Mbps x 5 Mbps	-	\$149.95

Crossroads Commercial Fiber Services

10 Mbps x 5 Mbps	-	\$149.95
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15 Mbps x 5 Mbps	-	\$169.95
20 Mbps x 10 Mbps	-	\$189.95
30 Mbps x 10 Mbps	-	\$229.95

Voice Services

Crossroads will affiliate with an Eligible Telecommunications Carrier certified in the State of Tennessee to provide voice services to residential and commercial customers.

Pricing for wireless and fiber-delivered voice services will be determined after the voice provider is selected, however, service levels (local and unlimited long distance), features, and pricing will be competitive with incumbent providers in all packages.

State/Local/Tribal Participation & Support

Crossroads is pursuing financial support from Hardeman County and the State of Tennessee (for service to the Chickasaw State Park). However, it is anticipated that available funding, if any, will be limited. Crossroads will also seek fiber construction assistance from the local public electric utility provider in exchange for providing fiber connectivity to the utility's electric substations throughout the county.

Potential Funding Availability

The total potential annual funding from the FCC database of the eligible census block locations in Hardeman County, TN considered for this project is estimated at \$1,019,382.68, as shown below.

RBE Potential Annual Subsidy for Eligible Locations per Census Tract				
County, State	Census Tract #	Eligible High Cost Locations	Extremely High Cost Locations	Annual Subsidy \$ Available
Hardeman County, TN	47069950100	974	42	\$ 329,458.31
Hardeman County, TN	47069950200	330	22	\$ 141,524.93
Hardeman County, TN	47069950300	12	1	\$ 7,058.91
Hardeman County, TN	47069950400	549	32	\$ 156,774.80
Hardeman County, TN	47069950500	502	8	\$ 153,570.01
Hardeman County, TN	47069950600	520	140	\$ 230,995.72
TOTAL		2887	140	\$1,019,382.68

Project Cost

The projected capital expenditures for this project is \$2,428,000, broken down in the following categories:

Aerial Fiber Backbone	-	\$2,100,000
New Towers to be built	-	\$ 211,000
Wireless Electronic Equipment	-	\$ 67,000
Licensed Wireless Links	-	\$ 50,000
CapEx Total		\$2,428,000

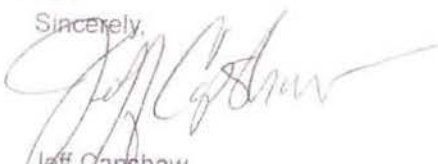
Funding Requirement

Crossroads would require funding as an upfront subsidy of **\$2,572,000**, dispersed over three years to support the capital build-out requirements of the technology plan, and also to provide operational support for the first three years of the project until sufficient new customers come on line. The funding would be requested to be distributed according to the following schedule:

Year 1 –	\$1,500,000
Year 2 –	\$1,021,600
Year 3 –	<u>\$ 50,400</u>
Total –	\$2,572,000

Capshaw Enterprises, LLC dba Crossroads Wi-Fi of Middleton, TN respectfully submits this Expression of Interest to participate in the Rural Broadband Experiment, under the FCC's WC Docket # 10-90.

Sincerely,



Jeff Capshaw
President

Enclosures: Exhibit 1 – Census Tract Map of Hardeman County, TN
Exhibit 2 - ConnectedTN Map of Advertised 3 Mbps Broadband in Hardeman Co
Exhibit 3 – Proposed Network Infrastructure Map

2010 CENSUS - CENSUS TRACT REFERENCE MAP: Hardeman County, TN



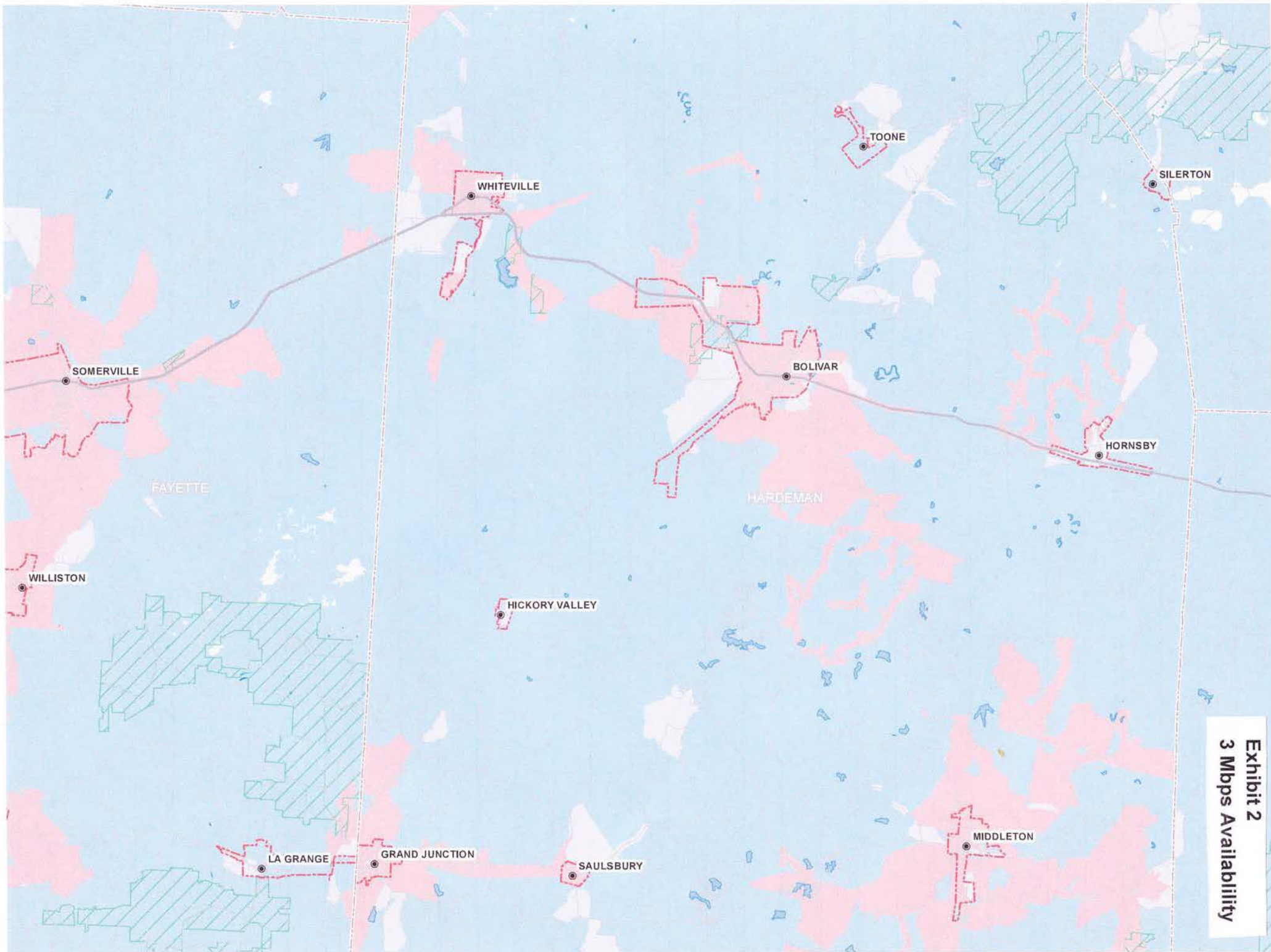


Exhibit 2
3 Mbps Availability

Exhibit 3
Network Coverage

